

Assignment for Academic Year 2025-2026 (Session Beginning January 2026)

B.A. -3rd Year

Course Code: MATH304TH

Course Title: Numerical Methods

ASSIGNMENT-1

Attempt any TWO of the following questions.

10 Marks

- Ques 1.** Find a root of equation $2x^3 - 2x - 5 = 0$ between 1 and 2 correct to three decimal places using Newton Raphson method?
- Ques 2.** Use secant method to find an approximate value of $3\sqrt{48}$.
- Ques 3.** Solve the system of equations $x_1 + x_2 + x_3 = 1$, $3x_1 + x_2 - 3x_3 = 5$, $x_1 - 2x_2 - 5x_3 = 10$ by LU decompositions method.
- Ques 4.** Given system of linear equations is $2x - 6y - z = -38$, $-3x - y + 7z = -34$, $-8x + y - 2z = -20$ determine the values of x, y and z using Jacobi Iterative Method?

ASSIGNMENT-2

Attempt any TWO of the following questions.

10 Marks

- Ques 1.** Using Newton's Forward interpolation formula find the cubic polynomial.

x	0	1	2	3
F(x)	1	2	1	10

- Ques 2.** Find $f(3.8)$ for an equation $f(x) = 2x^3 - 4x + 1$ using divided difference formula taking $x_1 = 2$ and $x_2 = 4$ with step size $h = 0.5$.
- Ques 3.** Given $\log_{10} 654 = 2.8156$, $\log_{10} 658 = 2.8182$, $\log_{10} 659 = 2.8189$ $\log_{10} 661 = 2.8202$. Use Lagrange formula to find the value of $\log_{10} 656$.
- Ques 4.** Find solution of an equation $x^3 + x + 2$, $x_1 = 2$ and $x_2 = 4$ at $x = 2.25$ here step value (h) = 0.25 using Newton's Forward difference formula.

ASSIGNMENT-3

Attempt any TWO of the following questions.

10 Marks

- Ques 1.** Evaluate the following integral $f(x) = \int_{-2}^2 \frac{t \sin t}{5 + 2t} dt$ using $h = 1$ by trapezoidal rule.

- Ques 2.** Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ using Simpson's $\frac{1}{3}$ rule taking $h = \frac{1}{4}$.

- Ques 3.** Approximate value of $\int_1^4 (e^{-2x} + 4x^2 - 8) dx$ by application of Simpson's $\frac{3}{8}$ rule with $n = 3$

- Ques 4.** Use Euler's method to find the solution to the differential equation $\frac{dy}{dx} = 3x + 4y$ at $x = 1$ with the initial condition $y(0) = 0$ and step size $h = 0.25$